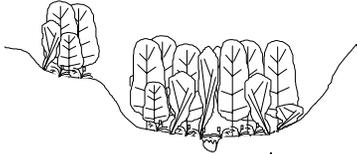


D. RIPARIAN FORESTS (FR)

FR1. **COTTONWOOD/WILLOW–WATER-LAYERED SOILS–FLOODPLAINS** (POAN3/SALUL-POPA2).
Cottonwood/Pacific willow-swamp bluegrass–Deep to very deep alluvial Fluvaquentic Endoaquolls–U-shaped draw bottoms and floodplains, < 9,400 ft



NUMBER OF SAMPLES	28, soil descriptions from 21 of these; one more not assigned to a CT (total 29)
ELEVATION	8,321 ft (7,530-9,380 ft); 2,536 m (2,295-2,859 m)
AVERAGE ASPECT	239°M (r = 0.46)
LITHOLOGY	A wide variety, with shale-sandstone-siltstone [48%], tuff-breccia-basalt-granite [42%] prominent
FORMATIONS ¹	A wide variety
LANDFORMS	Mostly draws and floodplains [67%], with some slumps, benches, swales, and ravines
SLOPE POSITIONS	Bottoms [93%]
SLOPE SHAPES	U-shaped [63%] to flat [16%]
SLOPE ANGLE	5.2% (1-17%)
SOIL PARENT MATERIAL	Mostly alluvium [81%]
COARSE FRAGMENTS	9.4% (0-48%) cover on surface, 27.3% (0-81%) by volume in soil
SOIL DEPTH	100 cm (46-285 cm); 39.3 in (18-112 in)
MOLLIC THICKNESS	72 cm (16-160 cm); 28.2 in (6-63 in)
TEXTURE	A wide variety of surface textures; subsurfaces have a wide variety of textures and coarse fraction, in water-deposited layers
SOIL CLASSIFICATION	Predominantly Endoaquolls [84%]; some of these are Fluvaquentic
TOTAL LIVE COVER	227.0% (45.4-616.5%)
NUMBER OF SPECIES	33.7 (18-55)
TOTAL LIVE COVER/NO. SPECIES	7.6% (1.2-23.6%)
CLIMATE	Warm, dry air, but well-watered soil. The weather station for Gunnison (see Climate chapter) is in an open area, that at one time was a cottonwood stand.
WATER	Water flows through these layered soils, horizontally parallel to the stream, and horizontally perpendicular to the stream. Water almost never ponds except within the streambanks.

Key to Community Types

1. Narrowleaf cottonwood >35% cover, often >50% cover (2)
1. Narrowleaf cottonwood absent or <30% cover..... (4)

2. Pacific willow present, often >10% cover. Swamp bluegrass present and >3% cover. Silvertop sedge (CAFO3), or reedgrass (CAC44 or CAST36) sometimes >10% cover. Alder always present, T-25% cover **A**
2. Pacific willow usually absent, rarely up to 45% cover. Swamp bluegrass usually absent, sometimes up to 5% cover. Silvertop sedge absent or <20%. Reedgrass absent or <5%. Alder sometimes absent (but sometimes up to 80% cover) (3)

3. River hawthorn present and >30% cover. Cottonwood sometimes absent, 0-90% cover..... **B**

3. River hawthorn absent or <10% cover **C**
4. River hawthorn present and >30% cover. Cottonwood sometimes absent, 0-90% cover **B**
4. River hawthorn absent or <10% cover (5)
5. Cottonwood present and >5% cover (6)
5. Cottonwood absent or <5% cover (8)
6. Kentucky bluegrass absent or <10% cover **D**
6. Kentucky bluegrass conspicuous, >10% cover (7)
7. Cottonwood >6% cover, often >20% cover. Total willow cover 0-10%. Rose often >20% cover **C**
7. Cottonwood <10% cover, often <% cover. Total willow cover 5-65%. Rose never <20% cover **E**
8. Alder conspicuous, >50% cover. Yellow willow >40% cover, total willow cover >60% **F**
8. Alder absent or <10% cover. Yellow willow absent or <25%, willows absent or total willow cover up to 65%, usually <50% (9)
9. Willows absent (10)
9. Willows present, total willow cover usually >5%. Shrubby cinquefoil present, usually >5% cover **E**
10. Cottonwood present and >5% cover. Rose >5% cover **D**
10. Understory dominated by moist-site exotics or invaders, such as quackgrass, Baltic rush, Kentucky bluegrass, and dandelion. Cottonwood absent or <5% cover. Big sagebrush (ARTR2) present, often >5% cover. Douglas rabbitbrush (CHV18) often present, sometimes >10% cover. Other prominent species may include dry grasses such as bottlebrush (ELEL5), western wheatgrass (PASM), or muttongrass (POFE) **G**

Community Type Descriptions

- A** *Cottonwood-Pacific willow-alder-swamp bluegrass* is dominated by cottonwood at >35% tall cover, often >55% cover. Pacific willow is always present and >1% cover, often >10% cover. Swamp bluegrass is always present and >3%, often >10% cover. Sedges (silvertop, Bebb's [CABE2]) are often conspicuous, as are reedgrasses. Total sedge plus reedgrass cover is always >10%. One plot had conspicuous red-osier dogwood (SWSE) at >20% cover, which could be called the Cottonwood/red-osier type in other places (Baker 1989a, for example) but our only such plot had similar soils to the rest of this ET.
- B** *River hawthorn-rose-Kentucky bluegrass* has river hawthorn conspicuous at >30%. Two plots lacked cottonwood, which was probably manually removed long ago. The third plot was dominated by cottonwood (>80% cover), but in other respects was similar to the other two plots. There are no willows. Kentucky bluegrass and rose are conspicuous in the understory.
- C** *Cottonwood-rose-Kentucky bluegrass-bedstraw-dandelion* is dominated by cottonwood at >40% cover. Rose, Kentucky bluegrass, and quackgrass (ELRE3) are evident in the understory. Northern bedstraw (GASE6) is always present. Willows are absent to sparse with <10% total willow cover.
- D** *Cottonwood-rose-snowberry-western wheatgrass* has a moderately sparse overstory of cottonwood, at 5-20% cover. Rose and snowberry (SYRO) are evident shrubs, but Kentucky bluegrass has <10% cover. Western wheatgrass is always present and >1% cover. Willows are absent.
- E** *Shrubby cinquefoil-sparse cottonwood-Kentucky bluegrass-Baltic rush* has a sparse cottonwood overstory, with Trace to 10% cover. Shrubby cinquefoil is always present, Trace to 20% cover. Total willow cover is always >5%, usually >10% cover.
- F** *Alder-yellow willow-Kentucky bluegrass-Baltic rush* is dominated by thinleaf alder at >70% cover, mixed with yellow and Geyer willows. The understory is dominated by exotics and invaders, such as Kentucky bluegrass, Baltic rush, quackgrass, and little barley.
- G** *Big sagebrush-quackgrass-Baltic rush-Kentucky bluegrass-dandelion* has prominent big sagebrush usually >10% cover. The understory is dominated by moist-site exotics and increasers such as Kentucky bluegrass, Baltic rush, quackgrass, and dandelion. One plot was dominated by quackgrass, and had only a trace of sagebrush.

Communities Not Assigned to a Community Type

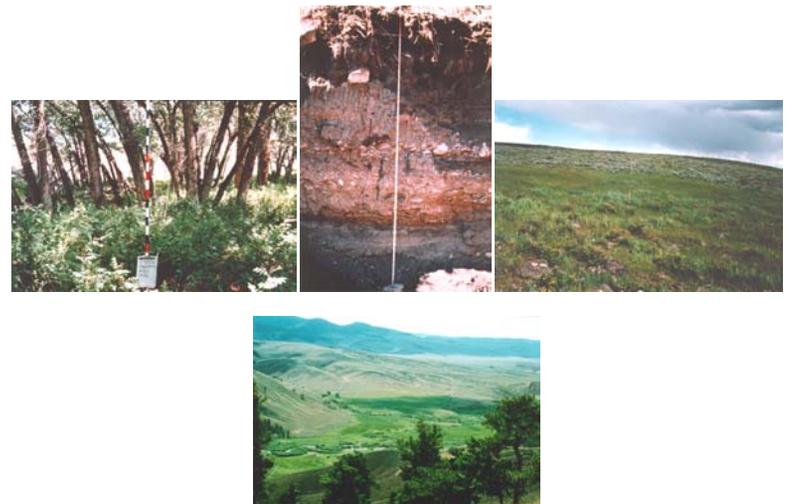
- A community dominated by cottonwood, with sparse willows and exotic grasses, but with river birch (BEFO2) prominent on a south-facing slope. This is an outlier of the eastern slope narrowleaf cottonwood/willow-birch type.

Community Type	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %	Prod. ¹ , lb/ac/yr Shrubs Gramin. Forbs
A. Cottonwood-Pacific willow-alder-swamp bluegrass	7,664 (7,570-7,840) 3.1 (1-5)	23 (0-52) 93 (70-155) 53 (16-145)	5 (1-16) 5 (1-10) LS	69 (46-91) 48 (17-85) 81 (62-107) 36 (27-47)	32 (28-41) 236 (196-294) 7.6 (5.5-10.5)	17-1289 136-1427 15-235
B. River hawthorn-rose- Kentucky bluegrass	8,370 (7,530-8,790) 7.0 (1-11)	28 (11-49) 99 (93-112) 68 (46-112)	1 (1-2) 16 (16-17) MS-EM	29 (0-88) 93 (66-120) 72 (68-80) 56 (37-89)	28 (18-35) 251 (187-314) 10.4 (5.3-17.5)	670-2560 207-461 95-1076
C. Cottonwood-rose- Kentucky bluegrass- bedstraw-dandelion	8,340 (7,960-8,760) 3.6 (3-5)	18 (4-25) 74 (57-107) 74 (57-107)	8 (0-18) 6 (0-17) MS-EM	51 (8-97) 37 (13-57) 74 (36-107) 59 (36-92)	37 (28-46) 221 (182-277) 6.3 (4.0-8.3)	13-448 90-1399 83-1133
D. Cottonwood-rose- snowberry-western wheatgrass	8,040 (7,920-8,160) 4.5 (4-5)	55 (29-81) 86 (81-91) 81 (81-81)	37 (37-38) 16 (11-21) EM	15 (9-22) 35 (17-53) 11 (10-12) 14 (8-21)	45 (39-50) 76 (45-106) 1.6 (1.2-2.1)	16-360 65-80 4-11
E. Shrubby cinquefoil- sparse cottonwood- Kentucky bluegrass- Baltic rush	8,666 (8,380-9,280) 9.3 (1-17)	47 46 46	17 (0-48) 11 (1-20) EM-ES	2 (0-9) 40 (15-67) 73 (41-137) 43 (19-92)	38 (27-46) 160 (101-228) 4.4 (2.5-6.8)	15-698 86-2706 10-1122
F. Alder-yellow willow- Kentucky bluegrass- Baltic rush	* *	* * *	* * EM-MS	1 (1-1) 149 (149-149) 291 (291-291) 176 (175-177)	27 (26-28) 616 (615-617) 22.8 (22.0-23.6)	3346 4053 1799
G. Big sagebrush- quackgrass-Baltic rush- Kentucky bluegrass- dandelion	8,694 (8,210-9,380) 4.8 (2-9)	23 (3-39) 132 (62-285) 90 (22-160)	10 21 (2-52) ES	0 (0-0) 45 (0-78) 74 (39-158) 37 (2-119)	32 (20-55) 155 (96-265) 5.5 (2.5-12.2)	0-1067 92-3420 1-1551

*. Unknown: measurements were not taken in this CT.

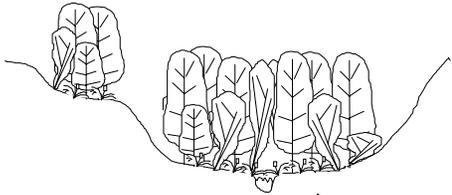
	TREES	
JUSC2	Juniperus scopulorum	Rocky Mountain juniper
POAN3	Populus angustifolia	narrowleaf cottonwood
	SHRUBS	
AMAL2	Amelanchier alnifolia	Saskatoon serviceberry
ARTR2	Artemisia tridentata	big sagebrush
CHVIP5	Chrysothamnus viscidiflorus ssp. pumilus	green rabbitbrush
CRR1	Crataegus rivularis	river hawthorn
PAVI11	Padus virginiana	common chokecherry
SABE2	Salix bebbiana	Bebb willow
SALUL	Salix lucida ssp. lasiandra	Pacific willow
	GRAMINOIDS	
ACPI2	Achnatherum pinetorum	pine needlegrass
AGROS2	Agrostis	bentgrass
AGGI2	Agrostis gigantea	redtop
BRIN7	Bromopsis inermis	smooth brome
CACA4	Calamagrostis canadensis	bluejoint reedgrass
CAST36	Calamagrostis stricta	Northern reedgrass
CAFO3	Carex foenea	silvertop sedge
CAGE	Carex geophila	dryland sedge
CAGE2	Carex geyeri	elk sedge
CASTE3	Carex stenophylla ssp. eleocharis	needleleaf sedge

	GRAMINOIDS (Continued)	
CRBR12	<i>Critesion brachyantherum</i>	little barley
DECE	<i>Deschampsia cespitosa</i>	tufted hairgrass
ELEL5	<i>Elymus elymoides</i>	bottlebrush squirreltail
ELRE3	<i>Elytrigia repens</i>	creeping quackgrass
JUARA4	<i>Juncus arcticus</i> ssp. <i>ater</i>	Baltic rush
KOMA	<i>Koeleria macrantha</i>	prairie junegrass
MUF1	<i>Muhlenbergia filiculmis</i>	slimstem muhly
PASM	<i>Pascopyrum smithii</i>	western wheatgrass
PHPR3	<i>Phleum pratense</i>	common timothy
PIMI7	<i>Piptatherum micranthum</i>	littleseed ricegrass
POA	<i>Poa</i>	bluegrass
POFE	<i>Poa fendleriana</i>	muttongrass
POPA2	<i>Poa palustris</i>	swamp bluegrass
POPR	<i>Poa pratensis</i>	Kentucky bluegrass
	FORBS	
ACLA5	<i>Achillea lanulosa</i>	western yarrow
ANSE4	<i>Androsace septentrionalis</i>	northern rock-jasmine
ASTER	<i>Aster</i>	aster
ASFO	<i>Aster foliaceus</i>	leafybract aster
ASSP16	<i>Aster spathulatus</i>	western aster
CABU2	<i>Capsella bursa-pastoris</i>	shepherd's purse
HAF12	<i>Hackelia floribunda</i>	many-flowered stickseed
IRMI	<i>Iris missouriensis</i>	wild iris
LUAR3	<i>Lupinus argenteus</i>	silvery lupine
MAST4	<i>Maianthemum stellatum</i>	star Solomon-plume
PECA4	<i>Penstemon caespitosus</i>	beardtongue
PHHO	<i>Phlox hoodii</i>	Hood's phlox
POHI6	<i>Potentilla hippiana</i>	horse cinquefoil
PSMO	<i>Pseudocymopterus montanus</i>	mountain parsely
SOCA6	<i>Solidago canadensis</i>	Canada goldenrod
TAOF	<i>Taraxacum officinale</i>	common dandelion
TRRE3	<i>Trifolium repens</i>	white Dutch clover
VIAM	<i>Vicia americana</i>	American vetch
FORB	forb unknown	unknown forb
	FERNS & FERN-ALLIES	
EQAR	<i>Equisetum arvense</i>	field horsetail



FR2. ASPEN-COTTONWOOD-DEEP ALLUVIAL SOILS-FLOODPLAINS (POTR5-POAN3/CACA4).

Aspen-cottonwood/reedgrass-swamp bluegrass-cow-parsnip-Deep to very deep alluvial Endoaquolls and other Borolls-U-shaped draw bottoms and floodplains, <9,200 ft



NUMBER OF SAMPLES	23, soil descriptions from 6 of these (total 23)
ELEVATION	8,466 ft (7,900-9,160 ft); 2,580 m (2,408-2,792 m)
AVERAGE ASPECT	253°M (r = 0.50)
LITHOLOGY	A wide variety, including several mixed sites
FORMATIONS ¹	A wide variety
LANDFORMS	Draws [50%], floodplains [17%], and swales [17%]
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	U-shaped [83%]
SLOPE ANGLE	10.7% (1-30%)
SOIL PARENT MATERIAL	Alluvium [70%] or colluvium [30%]
COARSE FRAGMENTS	4.8% (0-20%) cover on surface, 34.6% (7-70%) by volume in soil
SOIL DEPTH	91 cm (43-160 cm); 35.6 in (17-63 in)
MOLLIC THICKNESS	83 cm (19-160 cm); 32.8 in (7-63 in)
TEXTURE	A variety, with loam [50%] leading on the surface; subsurface is more clayey
SOIL CLASSIFICATION	Endoaquolls [67%], some Fluvaquentic
TOTAL LIVE COVER	300.7% (120.0-557.5%)
NUMBER OF SPECIES	27.7 (14-51)
TOTAL LIVE COVER/NO. SPECIES	13.1% (2.7-27.2%)
CLIMATE	Warm, dry air, but well-watered soil.
WATER	Water may be ponded at times in these sites.

Key to Community Types

1. Cottonwood >10% cover, codominant with aspen..... **B**
1. Cottonwood usually absent, rarely up to 10% cover (2)
2. Bluejoint reedgrass (CACA4) >20% cover. Swamp bluegrass always present, >10% cover. Kentucky bluegrass absent to <5% cover. Total willow cover >25% **A**
2. Bluejoint reedgrass usually absent, sometimes <20% cover. Swamp bluegrass usually absent, sometimes up to 30% cover. Kentucky bluegrass usually >10% cover, rarely absent or <5%. Willows absent or sparse, sometimes up to 40% cover (3)
3. Baltic rush (JUARA4) conspicuous, >30% cover. Kentucky bluegrass >60% cover..... **C**
3. Baltic rush absent or <30% cover. Kentucky bluegrass sometimes absent, 0-100% cover (4)
4. Alder (ALINT) prominent, >10% cover, often >20% (5)
4. Alder absent to very minor..... (6)
5. Exotic grasses such as smooth brome (BRIN7) or field timothy (PHPR) prominent, >20%..... **C**
5. Exotic grasses absent or minor **D**

6. Kentucky bluegrass prominent, >50% cover.....(7)
 6. Kentucky bluegrass absent or up to 40% cover.....(8)
(8)
7. Bush honeysuckle (DIIN5) conspicuous, >10% cover **D**
 7. Bush honeysuckle usually absent..... **F**
8. Total sedges >5% cover. Oak (QUGA) absent **D**
 8. Sedges absent or total <3% cover. Oak often present..... **E**

Community Type Descriptions

- A** *Aspen-reedgrass-swamp bluegrass-cow-parsnip-vetch* is dominated by aspen, without cottonwood. Blue willow (SALU2) or Pacific willow (SALUL) are prominent at >25% cover. Bluejoint reedgrass cover is >20%, and swamp bluegrass cover is >10%.
- B** *Cottonwood-aspen-rose-Kentucky bluegrass* Narrowleaf cottonwood cover is >10%, and shares dominance with aspen. Total willow cover is <10%. Bluejoint reedgrass is usually absent, but sometimes as much as 20% cover. Swamp bluegrass is absent or sometimes up to 10% cover.
- C** *Aspen-Kentucky bluegrass* is dominated by aspen with no cottonwood. One or more gooseberry or currant species is usually present at 5-20% cover. Alder may be prominent. Kentucky bluegrass is prominent with >60% cover. Bluejoint reedgrass and swamp bluegrass are absent. Some increasers may be conspicuous, such as Baltic rush or western wheatgrass (PASM). Exotic grasses such as smooth brome or field timothy may also be conspicuous.
- D** *Aspen-rose-Kentucky bluegrass-dandelion* Aspen is dominant, with honeysuckle or rose prominent.
- E** *Aspen-tree juniper-sparse dandelion-sparse rose* Aspen is codominant with Rocky Mountain juniper (JUSC2), Kentucky bluegrass is absent or <10% cover.
- F** *Aspen-rose-snowberry-Kentucky bluegrass-quackgrass-dandelion* Aspen is dominant, with rose and Kentucky bluegrass dominating the understory.

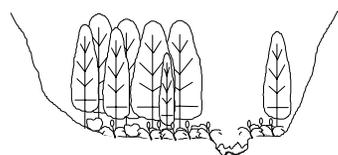
Community Type	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %	Prod. ¹ , lb/ac/yr Shrubs Gramin. Forbs
A. Aspen-reedgrass-swamp bluegrass-cow-parsnip-vetch	8,755 (8,350-9,160) 3.1 (1-5)	27 (22-32) 83 (76-89) 83 (76-89)	* 2 LS	46 (44-47) 76 (42-111) 60 (59-60) 62 (45-79)	40 (40-40) 244 (191-297) 6.1 (4.8-7.4)	147-2261 114-120 214-864
B. Cottonwood-aspen-rose-Kentucky bluegrass	8,572 (8,360-8,880) 4.6 (4-5)	57 (47-70) 62 (43-77) 43 (19-66)	12 (1-20) 7 (2-11) LM	62 (35-106) 67 (37-89) 56 (35-67) 37 (18-73)	42 (38-51) 222 (137-281) 5.5 (2.7-7.4)	93-1460 158-203 10-756
C. Aspen-Kentucky bluegrass	8,350 20	* * *	* * MS	55 (10-100) 66 (10-116) 185 (160-236) 101 (43-226)	19 (14-22) 410 (298-557) 21.2 (14.2-27.1)	9-2420 3468-3946 176-1808
D. Aspen-rose-Kentucky bluegrass-dandelion	8,528 (8,255-8,800) 5	16 160 160	* 9 EM	79 (45-126) 93 (59-150) 87 (16-145) 70 (20-105)	25 (14-36) 332 (223-389) 15.6 (6.2-24.3)	488-3377 106-3013 11-1355
E. Aspen-tree juniper-sparse dandelion-sparse rose	8,067 (7,900-8,160) 25.0 (20-30)	* * *	* * EM	56 (17-91) 44 (19-82) 29 (17-38) 7 (2-16)	26 (17-33) 136 (120-145) 5.7 (4.4-8.4)	18-1196 112-179 1-8
F. Aspen-rose-snowberry-Kentucky bluegrass-quackgrass-dandelion	8,563 (8,350-8,740) 6.4 (1-15)	17 (7-28) 107 (76-137) 107 (76-137)	7 7 EM-ES	67 (47-80) 29 (7-46) 89 (76-112) 65 (30-88)	33 (28-38) 251 (198-285) 7.7 (5.8-10.2)	7-217 354-1618 18-1046

*. Unknown: measurements were not taken in this CT.

	TREES	
JUSC2	<i>Juniperus scopulorum</i>	Rocky Mountain juniper
POAN3	<i>Populus angustifolia</i>	narrowleaf cottonwood
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
	SHRUBS	
ALINT	<i>Alnus incana ssp. tenuifolia</i>	thinleaf alder
ARCA13	<i>Artemisia cana</i>	silver sagebrush
ARTR2	<i>Artemisia tridentata</i>	big sagebrush
JUCO6	<i>Juniperus communis</i>	common juniper
PAV111	<i>Padus virginiana</i>	common chokecherry
PEFL15	<i>Pentaphylloides floribunda</i>	shrubby cinquefoil
QUGA	<i>Quercus gambelii</i>	scrub oak
RICE	<i>Ribes cereum</i>	wax currant
RIIN2	<i>Ribes inerme</i>	whitestem currant
RILA	<i>Ribes lacustre</i>	swamp gooseberry
SADR	<i>Salix drummondiana</i>	blue willow
SAGE2	<i>Salix geyeriana</i>	Geyer willow
SYRO	<i>Symphoricarpos rotundifolius</i>	mountain snowberry
	GRAMINOIDS	
AGCR	<i>Agropyron cristatum</i>	crested wheatgrass
BRIN7	<i>Bromopsis inermis</i>	smooth brome
CACA4	<i>Calamagrostis canadensis</i>	bluejoint reedgrass
CAFO3	<i>Carex foenea</i>	silvertop sedge
CAGE2	<i>Carex geyeri</i>	elk sedge
CAUT	<i>Carex utriculata</i>	beaked sedge
ELRE3	<i>Elytrigia repens</i>	creeping quackgrass
FEAR2	<i>Festuca arizonica</i>	Arizona fescue
JUARA4	<i>Juncus arcticus ssp. ater</i>	Baltic rush
PASM	<i>Pascopyrum smithii</i>	western wheatgrass
PHPR3	<i>Phleum pratense</i>	common timothy
POFE	<i>Poa fendleriana</i>	muttongrass
POPA2	<i>Poa palustris</i>	swamp bluegrass
POPR	<i>Poa pratensis</i>	Kentucky bluegrass

	FORBS	
ACLA5	<i>Achillea lanulosa</i>	western yarrow
ANAM	<i>Angelica ampla</i>	giant angelica
ASTER	<i>Aster</i>	aster
ASSP16	<i>Aster spathulatus</i>	western aster
CHDA2	<i>Chamerion danielsii</i>	fireweed
CICE	<i>Cirsium centaureae</i>	thistle
ERIGE2	<i>Erigeron</i>	fleabane
GERI	<i>Geranium richardsonii</i>	Richardson geranium
HESP6	<i>Heracleum sphondylium</i>	cow-parsnip
MAST4	<i>Maianthemum stellatum</i>	star Solomon-plume
OLDR	<i>Oligosporus dracunculus</i>	wild tarragon
PADI11	<i>Packera dimorphophylla</i>	splitleaf groundsel
SICA3	<i>Sidalcea candida</i>	white checker mallow
TAOF	<i>Taraxacum officinale</i>	common dandelion
THMO6	<i>Thermopsis montana</i>	golden banner
TRRE3	<i>Trifolium repens</i>	white Dutch clover
URGR3	<i>Urtica gracilis</i>	stinging nettle
VIAM	<i>Vicia americana</i>	American vetch
VINU2	<i>Viola nuttallii</i>	Nuttall violet
FORB	forb unknown	unknown forb
	FERNS & FERN-ALLIES	
EQAR	<i>Equisetum arvense</i>	field horsetail

FR3. **SPRUCE-COTTONWOOD-SANDY WET SOILS-TERRACES** (PIPU-POAN3/ALINT-CAFO3). Blue spruce-cottonwood/alder-silvertop sedge-Deep alluvial Endoaquolls, sandy subsurface-Flat to U-shaped terraces and floodplains, < 8,900 ft



NUMBER OF SAMPLES	8, soil descriptions from 4 of these (total 8)
ELEVATION	8,212 ft (7,810-8,825 ft); 2,503 m (2,380-2,690 m)
AVERAGE ASPECT	203°M (r = 0.69)
LITHOLOGY	All igneous, granite-gneiss-breccia-tuff [67%] or schist-rhyolite [17%]
FORMATIONS ¹	Xg-Xfn-Xb [42%], Tpl-Taf-Tiql [42%]
LANDFORMS	Terraces and floodplains [88%]
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	Flat or U-shaped [75%]
SLOPE ANGLE	3.6% (2-6%)
SOIL PARENT MATERIAL	Alluvium [89%]
COARSE FRAGMENTS	3.7% (0-14%) cover on surface, 14.7% (0-30%) by volume in soil
SOIL DEPTH	79 cm (74-80 cm); 31.1 in (29-31 in)
MOLLIC THICKNESS	36 cm (8-80 cm); 14.0 in (3-31 in)
TEXTURE	Loam, sandy loam, or silty loam on surface, Loamy sand, sandy loam, sand, or silty loam subsurface
SOIL CLASSIFICATION	All deep Endoaquolls
TOTAL LIVE COVER	250.7% (139.6-332.6%)
NUMBER OF SPECIES	30.5 (23-41)
TOTAL LIVE COVER/NO. SPECIES	8.4% (4.5-13.8%)
CLIMATE	Cool, moist to wet.
WATER	These soils are sandy, rocky, and very permeable, and the stream gradients are high enough such that most of the water is in the stream, and never ponds.

Key to Community Types

1. Swamp bluegrass (POPA2) conspicuous, >15% cover **B**
1. Swamp bluegrass absent or <10% cover (2)
2. Bluejoint reedgrass (CACA4) conspicuous, >15% cover. Kentucky bluegrass (POPR) conspicuous, >10% cover. Swamp bluegrass absent **A**
2. Bluejoint reedgrass absent to occasionally <15% cover. Kentucky bluegrass absent to <1% cover. Swamp bluegrass always present but <5% cover **C**

Community Type Descriptions

- A** *Blue spruce-cottonwood-alder-silvertop sedge-Kentucky bluegrass* is codominated by blue spruce and cottonwood. Bluejoint reedgrass is >15% cover, and silvertop sedge is >5% cover. Alder is always present, although sometimes only a Trace. Swamp bluegrass is absent, but Kentucky bluegrass is prominent, >10% cover. Baltic rush is absent or <5% cover.
- B** *Cottonwood-blue spruce-Kentucky bluegrass-Baltic rush* Bluejoint reedgrass is absent. Swamp bluegrass is prominent with >15% cover, and Kentucky bluegrass is prominent also. Baltic rush is conspicuous at >15% cover.

C *Blue spruce-cottonwood-rose-sparse swamp bluegrass* Kentucky bluegrass is absent or <1%. Swamp bluegrass is always present, but in small quantities, <10% cover. Baltic rush is absent.

Community Type	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Blue spruce-cottonwood-alder-silvertop sedge-Kentucky bluegrass	8,393 (8,210-8,760) 2.9 (3-3)	23 (15-30) 80 (80-80) 13 (13-13)	1 6 (1-10) LS-LM	79 (70-94) 59 (30-90) 90 (83-95) 64 (35-83)	34 (27-41) 304 (250-333) 9.0 (8.1-9.7)
B. Cottonwood-blue spruce-Kentucky bluegrass-Baltic rush	8,453 (8,080-8,825) 5.0 (4-6)	13 80 20	* * LM	74 (62-85) 18 (12-24) 143 (104-182) 39 (28-50)	28 (23-33) 273 (229-318) 10.4 (6.9-13.8)
C. Blue spruce-cottonwood-rose-sparse swamp bluegrass	7,870 (7,810-7,990) 3.3 (2-5)	10 (0-20) 78 (74-80) 56 (8-80)	13 2 (0-3) MS	88 (69-101) 60 (11-139) 14 (9-18) 19 (10-35)	29 (25-31) 182 (140-264) 6.3 (4.5-8.8)

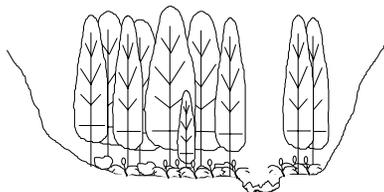
*. Unknown: measurements were not taken in this CT.

TREES			FORBS		
PIPU	<i>Picea pungens</i>	blue spruce	ACLA5	<i>Achillea lanulosa</i>	western yarrow
POAN3	<i>Populus angustifolia</i>	narrowleaf cottonwood	ANAM	<i>Angelica ampla</i>	giant angelica
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir	ARAN7	<i>Argentina anserina</i>	silverweed
SHRUBS			ASFO	<i>Aster foliaceus</i>	leafybract aster
ALINT	<i>Alnus incana ssp. tenuifolia</i>	thinleaf alder	ERFL	<i>Erigeron flagellaris</i>	trailing fleabane
ARUV	<i>Arctostaphylos uva-ursi</i>	kinnikinnick	FRVI	<i>Fragaria virginiana</i>	Virginia strawberry
ARTR2	<i>Artemisia tridentata</i>	big sagebrush	GERI	<i>Geranium richardsonii</i>	Richardson geranium
CRRI	<i>Crataegus rivularis</i>	river hawthorn	HESP6	<i>Heracleum sphondylium</i>	cow-parsnip
PAV111	<i>Padus virginiana</i>	common chokecherry	MAST4	<i>Maianthemum stellatum</i>	star Solomon-plume
PEFL15	<i>Pentaphylloides floribunda</i>	shrubby cinquefoil	ORPA3	<i>Oreochrysum parryi</i>	Parry goldenweed
ROWO	<i>Rosa woodsii</i>	Woods rose	POHI6	<i>Potentilla hippiana</i>	horse cinquefoil
SALIX	<i>Salix</i>	willow	POPU9	<i>Potentilla pulcherrima</i>	beauty cinquefoil
SABE2	<i>Salix bebbiana</i>	Bebb willow	PSMO	<i>Pseudocymopterus montanus</i>	mountain parsely
SAEX	<i>Salix exigua</i>	sandbar willow	RUAM9	<i>Rudbeckia ampla</i>	golden glow
SWSE	<i>Swida sericea</i>	red-osier	SICA3	<i>Sidalcea candida</i>	white checker mallow
GRAMINOIDS			TAOF	<i>Taraxacum officinale</i>	common dandelion
BRPU9	<i>Bromopsis pumpelliana</i>	Pumpelly brome	TRHY	<i>Trifolium hybridum</i>	alsike clover
CACA4	<i>Calamagrostis canadensis</i>	bluejoint reedgrass		FERNS & FERN-ALLIES	
CAFO3	<i>Carex foenea</i>	silvertop sedge	EQAR	<i>Equisetum arvense</i>	field horsetail
CARO5	<i>Carex rossii</i>	Ross sedge			
CAUT	<i>Carex utriculata</i>	beaked sedge			
ELTR7	<i>Elymus trachycaulus</i>	slender wheatgrass			
JUARA4	<i>Juncus arcticus ssp. ater</i>	Baltic rush			
LECI4	<i>Leymus cinereus</i>	giant wildrye			
POPA2	<i>Poa palustris</i>	swamp bluegrass			
POPR	<i>Poa pratensis</i>	Kentucky bluegrass			



FR4. SPRUCE/HONEYSUCKLE-REEDGRASS-DEEP SANDY MOIST SOILS-NARROW BOTTOMS

(PIPU-PIEN/DIIN4-CACA4). Spruce/honeysuckle-reedgrass-Deep sandy Cryaquolls and Cryaquents-V- to U-shaped alluvial floodplains and draw bottoms, 2-14% slope, 8,900-10,200 ft



NUMBER OF SAMPLES	15, soil descriptions from 5 of these (total 15)
ELEVATION	9,696 ft (8,960-10,475 ft); 2,955 m (2,731-3,193 m)
AVERAGE ASPECT	165°M (r = 0.31)
LITHOLOGY	Igneous, granite, tuff, rhyolite, lava, gneiss
FORMATIONS ¹	A variety of igneous
LANDFORMS	Floodplains [60%] and draws [40%]
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	U-shaped [60%] to V-shaped [40%]
SLOPE ANGLE	7.1% (2-14%)
SOIL PARENT MATERIAL	Predominantly alluvium [83%]
COARSE FRAGMENTS	.7% (0-10%) cover on surface, 28.5% (0-45%) by volume in soil
SOIL DEPTH	66 cm (50-82 cm); 26.0 in (20-32 in)
MOLLIC THICKNESS	6 cm (0-70 cm); 14.1 in (0-28 in)
TEXTURE	surfaces are sandy, with sandy loam and loamy sand leading; subsurfaces are sandy or loamy
SOIL CLASSIFICATION	Cryaquolls-Cryaquents [60%] or Cryoborolls [40%]
TOTAL LIVE COVER	371.8% (197.2-635.5%)
NUMBER OF SPECIES	24.1 (12-48)
TOTAL LIVE COVER/NO. SPECIES	18.6% (4.1-33.4%)
CLIMATE	Cool, moist to wet forest
WATER	These soils are sandy, rocky, and very permeable, and the stream gradients are high enough such that most of the water is in the stream, and never ponds

Key to Community Types

- 1. Blue spruce dominant, >45% cover. Water sedge (CAAQ) prominent, >12% cover **A**
- 1. Blue spruce usually absent or sometimes <10%. Water sedge usually absent, sometimes up to 12% (2)
- 2. Engelmann spruce dominant, 30-95% cover. Aspen absent to codominant (3)
- 2. Engelmann spruce absent or very minor, <5%. Aspen dominant **D**
- 3. Total graminoid cover >35%, often >40% **B**
- 3. Total graminoid cover <35% **C**

Community Type Descriptions

- A** *Blue spruce-alder-reedgrass-water sedge-horsetail* Blue spruce is dominant, usually without any other trees. Alder is conspicuous, >25% cover. The understory is dominated by bluejoint reedgrass, >25% cover, and water sedge, >12% cover.
- B** *Engelmann spruce-honeysuckle-reedgrass* has abundant Engelmann spruce, >35% cover, dominant or codominant with aspen or subalpine fir (ABBI2). Total graminoid cover is >40%, with bluejoint reedgrass and various sedge species prominent.
- C** *Engelmann spruce-honeysuckle* has abundant Engelmann spruce at >35% cover, dominant or codominant with aspen. Total graminoid cover is <40%.
- D** *Aspen-reedgrass* Aspen is dominant with >10% cover, often >40%. Spruces are absent to <1%; lodgepole pine is conspicuous in some stands. Bluejoint reedgrass is always present at >10% cover, often >20% cover.

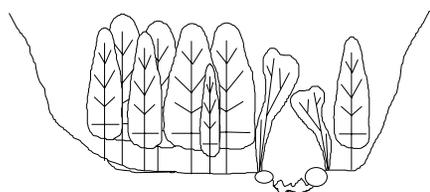
Community Type	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Blue spruce-alder-reedgrass-water sedge-horsetail	9,080 (8,980-9,180) 4.5 (2-7)	23 (0-45) 65 (60-70) 39 (8-70)	* * PN	48 (46-49) 49 (30-68) 99 (80-118) 61 (56-66)	25 (18-31) 278 (214-342) 11.5 (11.0-11.9)
B. Engelmann spruce-honeysuckle-reedgrass	10,280 (10,280-10,280) 14.0 (14-14)	37 70 70	4 * LS	104 (66-130) 63 (45-90) 58 (41-90) 63 (43-76)	28 (16-48) 289 (197-367) 14.3 (4.1-22.9)
C. Engelmann spruce-honeysuckle	9,652 (8,960-10,075) 5.0 (4-6)	31 (23-38) 74 (65-82) 34 (11-56)	6 (3-10) * LM	112 (43-200) 59 (11-110) 22 (5-32) 32 (7-52)	31 (12-40) 225 (217-236) 10.0 (5.4-18.5)
D. Aspen-reedgrass	10,475 (10,475-10,475) 9.5 (9-9)	28 50 0	* * MS	68 (10-110) 74 (1-146) 162 (60-235) 172 (50-265)	20 (12-28) 497 (306-636) 26.2 (16.1-33.4)

*. Unknown: measurements were not taken in this CT.

	TREES	
ABBI2	Abies bifolia	subalpine fir
PIEN	Picea engelmannii	Engelmann spruce
PIPU	Picea pungens	blue spruce
PICO	Pinus contorta	lodgepole pine
POTR5	Populus tremuloides	quaking aspen
	SHRUBS	
ALINT	Alnus incana ssp. tenuifolia	thinleaf alder
ARCA13	Artemisia cana	silver sagebrush
DIIN5	Distegia involucrata	bush honeysuckle
JUCO6	Juniperus communis	common juniper
PEFL15	Pentaphylloides floribunda	shrubby cinquefoil
RIIN2	Ribes inerme	whitstem currant
RILA	Ribes lacustre	swamp black gooseberry
RIMO2	Ribes montigenum	mountain gooseberry
ROWO	Rosa woodsii	Woods rose
RUID	Rubus idaeus	American red raspberry

	SHRUBS (Continued)	
SADR	Salix drummondiana	blue willow
SALU2	Salix lutea	yellow willow
SAMO2	Salix monticola	serviceberry willow
SAPL2	Salix planifolia	planeleaf willow
SAMI15	Sambucus microbotrys	mountain red elderberry
SYRO	Symphoricarpos rotundifolius	mountain snowberry
VAMYO	Vaccinium myrtillus ssp. oreophilum	Rocky Mountain whortleberry
	GRAMINOIDS	
ALPR3	Alopecurus pratensis	meadow foxtail
BRCA10	Bromopsis canadensis	fringed brome
CACA4	Calamagrostis canadensis	bluejoint reedgrass
CAREX	Carex	sedge
CAAQ	Carex aquatilis	water sedge
CAGE2	Carex geyeri	elk sedge
CAPA14	Carex pachystachya	Chamisso sedge
CAUT	Carex utriculata	beaked sedge
ELEL5	Elymus elymoides	bottlebrush squirreltail
ELGL	Elymus glaucus	blue wildrye
ELRE3	Elytrigia repens	creeping quackgrass
FETH	Festuca thurberi	Thurber fescue
JUARA4	Juncus arcticus ssp. ater	Baltic rush
POPR	Poa pratensis	Kentucky bluegrass
	FORBS	
ACLA5	Achillea lanulosa	western yarrow
ACCO4	Aconitum columbianum	Columbian monkshood
ANPI2	Angelica pinnata	small-leaf angelica
ARAN7	Argentina anserina	silverweed
ARCO9	Arnica cordifolia	heartleaf arnica
ASTER	Aster	aster
CACO6	Cardamine cordifolia	heartleaf bittercress
CHDA2	Chamerion danielsii	fireweed
COSC2	Conioselinum scopulorum	Rocky Mountain hemlock-parsley
FRVI	Fragaria virginiana	Virginia strawberry
GERI	Geranium richardsonii	Richardson geranium
HESP6	Heracleum sphondylium	cow-parsnip
LALE2	Lathyrus leucanthus	aspen peavine
LUAR3	Lupinus argenteus	silvery lupine
MAST4	Maianthemum stellatum	star Solomon-plume
MECI3	Mertensia ciliata	mountain bluebells
MIGU	Mimulus guttatus	common monkey flower
ORPA3	Oreochrysum parryi	Parry goldenweed
OSCH	Osmorhiza chilensis	sweet cicely
OSDE	Osmorhiza depauperata	sweet cicely
OXFE	Oxypolis fendleri	Fendler cowbane
PEPA3	Pedicularis parryi	Parry lousewort
PEPR7	Pedicularis procera	Gray's lousewort
PSLE	Psychrophila leptosepala	elkslip marsh-marigold
SESE2	Senecio serra	butterweed groundsel
SETR	Senecio triangularis	arrowleaf groundsel
STFA3	Streptopus fassettii	clasp-leaf twisted-stalk
TAOF	Taraxacum officinale	common dandelion
THFE	Thalictrum fendleri	Fendler meadow-rue
THSP	Thalictrum sparsiflorum	few-flowered meadow-rue
VAED	Valeriana edulis	edible valerian
VIAM	Vicia americana	American vetch
FORB	forb unknown	unknown forb
	FERNS & FERN-ALLIES	
EQAR	Equisetum arvense	field horsetail

FR5. **SPRUCE/RED-OSIER-MOIST SOILS-BOTTOMS** (PIPU-PIEN/SWSE). Spruce/red-osier-Cryaquolls and Cryaquents-V-shaped, narrow alluvial watercourses, 8,500-9,200 ft



NUMBER OF SAMPLES	7, soil descriptions from 1 of these (total 7)
ELEVATION	8,854 ft (8,560-9,180 ft); 2,699 m (2,609-2,798 m)
AVERAGE ASPECT	192°M (r = 0.76)
LITHOLOGY	Granite [78%] and mixed [22%]
FORMATIONS'	Xg [71%] and mixed [29%]
LANDFORMS	Gorges, terraces, floodplains
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	V-shaped [75%]
SLOPE ANGLE	10.7% (3-36%)
SOIL PARENT MATERIAL	Alluvium [55%] or colluvium [45%]
COARSE FRAGMENTS	24.2% (2-95%) cover on surface, 0.0% (52-52%) by volume in soil
SOIL DEPTH	50 cm; 20 in
MOLLIC THICKNESS	6 cm; 2 in
TEXTURE	Silt loam surface and subsurface
SOIL CLASSIFICATION	Cryaquolls [63%] or Cryaquents [25%]
TOTAL LIVE COVER	172.7% (76.4-279.5%)
NUMBER OF SPECIES	24.0 (17-31)
TOTAL LIVE COVER/NO. SPECIES	7.4% (3.5-10.8%)
CLIMATE	Cool to cold, moist, highly shaded forest.
WATER	These soils are rocky and very permeable, and the stream gradients are high enough that most of the water is in the stream, and never ponds.

Key to Community Types

1. Dominated by spruce (blue or Engelmann), >45% cover, sometimes codominated by subalpine fir. Horsetail (EQAR or HIHYA) prominent, >15% cover. Whitestem currant (RIIN2) always present and >1% cover. Bluejoint reedgrass (CACA4) absent to prominent, 0-60% **A**
1. Trees absent or minor, up to 1% cover. Dominated by red-osier dogwood. Horsetail absent to <5% cover. Whitestem currant absent or <2% cover. Bluejoint reedgrass absent to minor, <5% cover..... **B**

Description of Community Types

- A** *Spruce-red-osier* is dominated by blue or Engelmann spruce which is sometimes codominant with subalpine fir. The understory is dominated by red-osier dogwood at >20% cover, often >50% cover. Field horsetail (EQAR) is prominent, with >15% cover. Bluejoint reedgrass is sometimes prominent at >35% cover. Bush honeysuckle (DIIN5) is constant.
- B** *Red-osier* is dominated by red-osier with >40% cover. Trees are absent to minor, usually with <1% cover. Field horsetail is absent to <5% cover. Bluejoint reedgrass is never prominent. Whitestem currant (RIIN2) is constant.

Communities Not Assigned to a Community Type

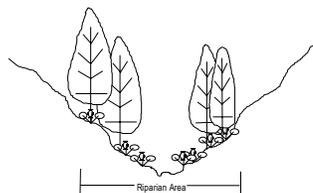
- A community dominated by raspberry (RUID) and rose, with elk sedge and Kentucky bluegrass prominent. Spruce and fir were formerly dominant in this bottom, but the trees are knocked down almost every year by snowslides.

Community Type	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Spruce-red-osier	8,925 (8,670-9,180) 4.3 (3-5)	52 50 6	16 (2-37) 14 (2-25) LS	83 (61-109) 77 (35-129) 37 (3-63) 12 (4-23)	25 (24-26) 238 (202-279) 9.6 (8.4-10.7)
B. Red-osier	8,698 (8,560-8,925) 19.7 (9-36)	* * *	33 (2-95) 9 (2-20) MS	0 (0-0) 109 (64-153) 4 (3-5) 10 (7-15)	21 (17-24) 125 (76-166) 6.3 (3.5-9.8)

*. Unknown: measurements were not taken in this CT.

	TREES	
ABBI2	<i>Abies bifolia</i>	subalpine fir
PIEN	<i>Picea engelmannii</i>	Engelmann spruce
PIPU	<i>Picea pungens</i>	blue spruce
	SHRUBS	
ALINT	<i>Alnus incana</i> ssp. <i>tenuifolia</i>	thinleaf alder
DIIN5	<i>Distegia involucrata</i>	bush honeysuckle
JUCO6	<i>Juniperus communis</i>	common juniper
PHMO4	<i>Physocarpus monogynus</i>	mountain ninebark
ROWO	<i>Rosa woodsii</i>	Woods rose
RUID	<i>Rubus idaeus</i>	American red raspberry
SADR	<i>Salix drummondiana</i>	blue willow
SWSE	<i>Swida sericea</i>	red-osier
	GRAMINOIDS	
CACA4	<i>Calamagrostis canadensis</i>	bluejoint reedgrass
CAGE2	<i>Carex geyeri</i>	elk sedge
CAUT	<i>Carex utriculata</i>	beaked sedge
PIMI7	<i>Piptatherum micranthum</i>	littelseed ricegrass
PONE12	<i>Poa nemoralis</i> ssp. <i>interior</i>	interior bluegrass
POPR	<i>Poa pratensis</i>	Kentucky bluegrass
	FORBS	
GEMA4	<i>Geum macrophyllum</i>	large-leaved avens
HEVI4	<i>Heterotheca villosa</i>	hairy golden aster
MAAM6	<i>Maianthemum amplexicaule</i>	feather Solomon-plume
PAPE5	<i>Parietaria pensylvanica</i>	Pennsylvania pellitory
POHI6	<i>Potentilla hippiana</i>	horse cinquefoil
RUAM9	<i>Rudbeckia ampla</i>	golden glow
	FERNS & FERN-ALLIES	
EQAR	<i>Equisetum arvense</i>	field horsetail
HIHYA	<i>Hippochaete hyemalis</i> ssp. <i>affinis</i>	common scouring-rush

FR6. **FIR-SPRUCE/WET FORBS–MOIST SOILS–NARROW V-SHAPED BOTTOMS** (ABBI2-PIEN/SETR-MECI3-CACO6). Subalpine fir-Engelmann spruce/Arrowleaf groundsel-bluebells-bittercress–Moderately deep to deep Cryaquolls–V-shaped, narrow ravines and draw bottoms, >9,500 ft



NUMBER OF SAMPLES	12, soil descriptions from 3 of these (total 12)
ELEVATION	10,254 ft (9,590-11,640 ft); 3,125 m (2,923-3,548 m)
AVERAGE ASPECT	127°M (r = 0.16)
LITHOLOGY	A variety, including some igneous such as breccia and granite [67%] or sedimentary such as shale and sandstone [33%]
FORMATIONS ¹	Tpl [44%], Xg [22%], Km [22%], Kd
LANDFORMS	Ravines and draws [63%], several others
SLOPE POSITIONS	Bottoms
SLOPE SHAPES	V-shaped or otherwise concave
SLOPE ANGLE	10.7% (2-27%)
SOIL PARENT MATERIAL	Alluvium [46%] or colluvium [46%]
COARSE FRAGMENTS	3.9% (0-10%) cover on surface, 42.9% (29-59%) by volume in soil
SOIL DEPTH	50 cm (20-76 cm); 19.6 in (8-30 in)
MOLLIC THICKNESS	26 cm (0-65 cm; 10.2 in (0-26 in)
TEXTURE	A variety of surface textures; subsurfaces are sandier, such as sandy clay loam or sandy loam
SOIL CLASSIFICATION	Cryaquolls [83%], mostly moderately deep
TOTAL LIVE COVER	231.3% (113.2-415.5%)
NUMBER OF SPECIES	23.3 (7-37)
TOTAL LIVE COVER/NO. SPECIES	12.6% (5.3-34.7%)
CLIMATE	Cold to moderately cold, moist, highly shaded Subalpine forest.
WATER	These soils are rocky and very permeable, and the stream gradients are high enough that most of the water is in the stream, and never ponds. Some of these streams dry up in late season of dry years.

Key to Community Types

1. Dominated by Engelmann spruce (>20% cover) and subalpine fir **A**
1. Dominated by aspen (>50% cover) or Douglas-fir; or trees absent..... (2)

2. Dominated by Douglas-fir, codominant with subalpine fir, Engelmann spruce, and aspen ... **A**
2. Dominated by aspen, or trees absent..... (3)

3. Dominated by aspen, >50% cover. Thinleaf alder prominent, >30% cover. Total shrub cover >80%. Total graminoid cover >80% **B**
3. Trees absent. Thinleaf alder and other shrubs absent. Total graminoid cover <95% **C**

Description of Community Types

- A** *Engelmann spruce-subalpine fir-bittercress-arrowleaf groundsel* is dominated by Engelmann spruce at >20% cover, often >50%, and subalpine fir, usually at >10% cover. Total graminoid cover is <35%, mostly bluejoint reedgrass. One or more wet-site forb species are prominent.
- B** *Aspen-alder-reedgrass-wet forbs* is dominated by aspen, usually alone, but occasionally with small amounts of Douglas-fir or lodgepole pine (PICO); lodgepole pine is apparently fugitive from adjacent spruce-fir stands. Thinleaf alder is prominent at >30% cover. Total shrub cover is >80%. Bluejoint reedgrass is prominent, >20% cover, as are various sedge species at >30% cover. Total graminoid cover is >80%.
- C** *Wet forbs* has no trees or shrubs. Bluejoint reedgrass or wet forbs are dominant. Total graminoid cover is <95%.

Communities Not Assigned to a Community Type

- A community dominated by aspen, with Douglas-fir codominant or subdominant and the understory supports alder, wet forbs, and bluejoint reedgrass, but bush honeysuckle (DIIN5) is also prominent. This plot may be a Douglas-fir phase of this type, which is underrepresented in our sample.

Community Type	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Serai Stage	Cover, %: Trees Shrubs Graminoids Forbs	No. Species Total Live Cover, % TLC/NS, %
A. Engelmann spruce-subalpine fir-bittercress-arrowleaf groundsel	9,970 (9,590-10,860) 9.0 (2-18)	43 (29-59) 55 (50-65) 52 (40-65)	4 (1-10) 3 (1-8) LS	96 (69-142) 5 (0-22) 17 (2-30) 83 (32-133)	31 (25-37) 210 (186-237) 6.9 (5.3-8.2)
B. Aspen-alder-reedgrass-wet forbs	* *	* * *	* * MS	68 (56-87) 88 (80-92) 100 (80-130) 122 (100-150)	16 (11-23) 389 (369-416) 26.8 (16.0-34.7)
C. Wet forbs	10,823 (10,100-11,640) 14.2 (3-27)	* 44 (20-76) 0 (0-0)	4 (1-10) 4 (2-5) EM	0 (0-0) 0 (0-0) 34 (0-90) 82 (23-117)	15 (7-21) 116 (113-119) 9.8 (5.6-16.7)

*. Unknown: measurements were not taken in this CT.

	TREES	
ABBI2	<i>Abies bifolia</i>	subalpine fir
PIEN	<i>Picea engelmannii</i>	Engelmann spruce
POTR5	<i>Populus tremuloides</i>	quaking aspen
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
	SHRUBS	
ALINT	<i>Alnus incana</i> ssp. <i>tenuifolia</i>	thinleaf alder
DIIN5	<i>Distegia involucrata</i>	bush honeysuckle
JUCO6	<i>Juniperus communis</i>	common juniper
PEFL15	<i>Pentaphylloides floribunda</i>	shrubby cinquefoil
RIIN2	<i>Ribes inerne</i>	whitestem currant
SYRO	<i>Symphoricarpos rotundifolius</i>	mountain snowberry
	GRAMINOIDS	
BRCA10	<i>Bromopsis canadensis</i>	fringed brome
CACA4	<i>Calamagrostis canadensis</i>	bluejoint reedgrass
CAREX	<i>Carex</i>	sedge
CADI6	<i>Carex disperma</i>	soft leaved sedge
CAFO3	<i>Carex foenea</i>	silvertop sedge
CAGE2	<i>Carex geyeri</i>	elk sedge
ELGL	<i>Elymus glaucus</i>	blue wildrye
ELRE3	<i>Elytrigia repens</i>	creeping quackgrass
JUPA	<i>Juncus parryi</i>	Parry rush
POPR	<i>Poa pratensis</i>	Kentucky bluegrass
SCMI2	<i>Scirpus microcarpus</i>	panicled bulrush
TRWO3	<i>Trisetum wolfii</i>	Wolf's trisetum
	FORBS	
ACLA5	<i>Achillea lanulosa</i>	western yarrow
ACCO4	<i>Aconitum columbianum</i>	Columbian monkshood
ARCO9	<i>Arnica cordifolia</i>	heartleaf arnica
ARLO6	<i>Arnica longifolia</i>	longleaf arnica
CACO6	<i>Cardamine cordifolia</i>	heartleaf bittercress
CARH4	<i>Castilleja rhexifolia</i>	splitleaf paintbrush
COSC2	<i>Conioselinum scopulorum</i>	Rocky Mountain hemlock-parsley
DEBA2	<i>Delphinium barbeyi</i>	Barbey larkspur
EPILO	<i>Epilobium</i>	willow herb
ERPE3	<i>Erigeron peregrinus</i>	peregrine fleabane
FRSP	<i>Frasera speciosa</i>	monument plant
GERI	<i>Geranium richardsonii</i>	Richardson geranium
HESP6	<i>Heracleum sphondylium</i>	cow-parsnip
LIPO	<i>Ligusticum porteri</i>	osha
MECI3	<i>Mertensia ciliata</i>	mountain bluebells
MIOD2	<i>Micranthes odontoloma</i>	brook saxifrage
MIST3	<i>Mitella stauropetala</i>	side-petaled miterwort
OSCH	<i>Osmorhiza chilensis</i>	sweet cicely
OXFE	<i>Oxypolis fendleri</i>	Fendler cowbane
PERA	<i>Pedicularis racemosa</i>	sickletop lousewort
PSMO	<i>Pseudocymopterus montanus</i>	mountain parsely
SETR	<i>Senecio triangularis</i>	arrowleaf groundsel
STELL	<i>Stellaria</i>	chickweed
STFA3	<i>Streptopus fassettii</i>	clasp-leaf twisted-stalk
TAOF	<i>Taraxacum officinale</i>	common dandelion
THFE	<i>Thalictrum fendleri</i>	Fendler meadow-rue
VETE4	<i>Veratrum tenuipetalum</i>	Colorado false-hellebore
VEAM2	<i>Veronica americana</i>	American brooklime
	FERNS & FERN-ALLIES	
EQAR	<i>Equisetum arvense</i>	field horsetail

